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~~Patent Claims~~ WHAT IS CLAIMED IS:

1. A semiconductor laser comprising an arrangement for measuring operating temperature, characterized in that

at least one temperature sensor (1) is secured directly on or integrated in the semiconductor laser chip (4).

2. The semiconductor laser as recited in the preamble of Claim 1, characterized in that

at least one temperature sensor (1) is secured by welding directly on or in the semiconductor laser chip (4), the energy required for welding coming from a light source, in particular from a Nd-glass source or a Nd-YAG source or from a source having a similar spatial and similar spectral distribution.

3. The semiconductor laser as recited in the preamble of Claim 1 or of Claim 2, characterized in that

prior to the actual welding operation, the temperature sensor (1) is sealed into a highly electrically insulating glass.

4. The semiconductor laser as recited in one of Claims 1 or 2, characterized in that

the temperature sensor (1) is arranged and secured in a hole that is placed in, in particular burned by light-welding into, the laser chip (4).

5. The semiconductor laser as recited in one of Claims 1 through 4, characterized in that

the laser chip (4) itself is designed as a temperature sensor (1), in which additional wires (for example 2 and 3) for measuring the electrical resistance through the semiconductor laser chip (4) (bulk resistor 11; Figure 5a,b) are mounted on the same.

6. The semiconductor laser as recited in Claim 5, characterized in that

mounted on the semiconductor laser chip (4) is only one additional wire (3) which is used, together with a pumping current lead wire (8), as a second sensor supply lead for electrical resistance measurement.

7. The semiconductor laser as recited in one of Claims 1 through 6, characterized in that

the temperature sensor(s) (1) is designed as a thermoelement.

8. The semiconductor laser as recited in one of Claims 1 through 7, characterized in that

the temperature sensor (1) is designed as a thermoelement of two wires, which are joined by laser-light welding and are secured, in the same work step, to semiconductor laser chip (4).

9. The semiconductor laser as recited in Claim 8, characterized in that

before the two wires are joined, a contact surface of the material of the one or other wire is deposited on the semiconductor laser.

10. The semiconductor laser as recited in the preamble of Claim 1, characterized in that

to measure the operating temperature of a semiconductor laser array, the temperature of the individual lasers (5) is measured; and

that their output wavelengths are adjusted by varying their pumping currents.

11. The semiconductor laser as recited in one of Claims 1 through 10, characterized in that

to adjust temperature with local selectivity, the thermoelements arranged on the semiconductor laser chip are operated in a reversed operation as Peltier elements having a current source.

12. The semiconductor laser as recited in Claim 11, characterized in that

the wavelength of the semiconductor laser chip (4) is measured and, when necessary, the wavelength of the laser chip is also adjusted, telecommunications lasers having one measuring point per active laser zone, and high-performance lasers having a plurality of measuring points per laser chip along the active laser zone.

13. The semiconductor laser as recited in Claim 11 or 12, characterized in that

the thermoelements and/or Peltier elements are operated and configured in a cascade arrangement.

14. The semiconductor laser as recited in one of Claims 1 through 13, characterized in that

the measured temperature is used in a closed-loop control circuit having a setter (15) to adjust the temperature.

15. The semiconductor laser as recited in one of Claims 1 through 14, characterized in that

a plurality of temperature sensors and temperature setters, each having one separate temperature controller, are arranged on the semiconductor laser.

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